

What is claimed is:

1. A communication system comprising:

a plurality of chips, each including a sensor, a chip  
5 ID retaining circuit for retaining a chip ID number, and a  
first resonance circuit; and

a reader comprising a second resonance circuit  
configured for carrying out transmission and/or reception  
of data to or from said plurality of chips, a frequency  
10 conversion circuit, and a chip ID compare circuit for  
comparing said chip ID number of each said chip for a match;

wherein, based on said chip ID retaining circuit, said  
frequency conversion circuit is configured to adjust  
carriers to a resonance frequency which is optimum per said  
15 chip and which has been obtained by a frequency sweep  
beforehand, and said reader is configured to communicate  
with each of said chips at said resonance frequency.

2. The communication system according to claim 1 wherein  
20 said reader further comprises data storage for storing  
resonance frequency information which stores a list of  
correspondence between said chip ID number and said optimum  
resonance frequency.

3. The communication system according to claim 1, further comprising an external control device which connects to said reader, said external control device including data storage for storing resonance frequency information and which  
5 stores a list of correspondence between said chip ID number and said optimum resonance frequency.

4. The communication system according to claim 1, wherein said resonance frequency is determined separately for each  
10 of said chips by said first resonance circuit on each of said chips.

5. The communication system according to claim 1, wherein said resonance frequencies are determined separately for  
15 each of said chips owing to circumstances around each said chip.

6. The communication system according to claim 1, wherein each of said chips further comprises a radio frequency (RF)  
20 control unit which comprises a rectification circuit, demodulation circuit, and modulation circuit, a power supply control unit, a communication control circuit, and a signal processing circuit,

wherein said signal processing circuit is configured  
25 to digitize signals detected by said sensor;

said demodulation circuit is configured to compare said data received with said chip ID number retained by said chip ID retaining circuit and demodulate said data;

and wherein said modulation circuit is configured to  
5 modulate the digitized signals detected by said sensor; and

the modulated digital signals detected by said sensor are transmitted by radio frequency (RF) to said reader.

7. The communication system according to claim 1, wherein  
10 said sensor is configured to measure the quantity, temperature, or pressure of an object to detect.

8. The communication system according to claim 1, further comprising:

15 a transport mechanism comprising piping and containers, wherein said chips are installed in said transport mechanism and said reader is placed outside said transport mechanism.

20 9. The communication system according to claim 8, wherein said sensor is configured to detect the conditions of a liquid fluid present inside said transport mechanism.

10. The communication system according to claim 8, wherein  
25 said chips are configured to communicate with said reader

and transmit said chip ID number and measurements detected by said sensor;

and said chip ID number is corresponded to position information for each of said chips.

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11. The communication system according to claim 8, wherein sections of said piping where said chips are installed have lower conductivity than other sections.

10 12. The communication system which is applied to the transport mechanism according to claim 8, wherein sections of said piping where said chips are installed have through holes and cores are inserted in said through holes.

15 13. The communication system according to claim 8, wherein said chips are supplied with required electric power by radio frequency transmission from said reader.

14. The communication system which is applied to the  
20 transport mechanism according to claim 8, further comprising:

an external control device which is installed outside said transport mechanism,

a transceiver connected to said external control  
25 device,

a transceiver antenna connected to said transceiver,  
and a reader antenna connected to said reader,

wherein said reader is provided with an additional  
long-range communication function and communicates with  
5 said external control device via said reader antenna, said  
transceiver antenna, and said transceiver.

15. A communicating reader comprising a resonance circuit,  
an oscillator, and a radio frequency control unit which  
10 includes a frequency conversion circuit,  
wherein said resonance circuit and said oscillator carries  
out signal transmission and reception for communication  
with chips and a frequency sweep for said chips; and

said frequency conversion circuit is configured to  
15 convert a transmitting frequency to each of said chips to  
a resonance frequency for communication with each of said  
chips, based on said frequency sweep.

16. The communicating reader according to claim 15, further  
20 comprising a chip ID compare circuit which retains chip ID  
codes independently retained on said chips and compares said  
chip ID codes for a match.

17. The communicating reader according to claim 15, further  
25 comprising a mechanism for controlling the strength of

signals to be transmitted to said chips, according to the strength of signals received from said chips.

18. A communication method comprising:

5       transmitting from a reader information containing a chip ID code while performing a frequency modulation;

      detecting in a chip whether there is a match between said chip ID code transmitted from the reader and a chip ID number unique to said chip; and

10       transmitting from said chip a result of detecting said match signals detected by a sensor included on said chip to said reader,

      wherein, in said detecting step, said chip compares both of said chip ID code and said chip ID number for a match  
15       during said frequency modulation.

19. The communication method according to claim 18, wherein said information transmitting step and said detecting step are repeated until a match between both of said ID codes is  
20       detected.

20. The communication method according to claim 18, wherein a plurality of chips are used and each of said chips detects whether there is a match between said chip ID code received

from said reader and said chip ID number unique to each of said chips.